CLAIMS

We claim:

1. A robot comprising:

a base member;

a moving platform operative as the end effector of the robot;

a plurality of adjustable links connecting said base member to said moving platform, the status of each of said adjustable links being known by means of a sensor associated with each of said links; and

a single additional sensor connected between said base member and said moving platform.

2. A robot according to claim 1 and wherein at least one of said adjustable links is a linear extensible link.

3. A robot according to claim 2 and wherein said sensor associated with said linear extensible link is a length sensor.

4. A robot according to claim 1 and wherein at least one of said adjustable links is an angular rotational hinge.

5. A robot according to claim 4 and wherein said sensor associated with said angular rotational hinge is an angular sensor.

6. A robot according to any of the previous claims and wherein said single additional sensor is a length sensor.

7. A robot according to any of the previous claims and wherein said single additional sensor is an angular sensor.

8. A robot according to any of the previous claims and also comprising a controller which verifies at least one of the position and orientation of said moving platform as determined by the sensors associated with each of said plurality of links, by means of the output of said single additional sensor.

9. A robot according to any of the previous claims and wherein said controller provides an absolute verification of at least one of the position and orientation of said moving platform in the event that any one sensor is providing an erroneous output.

10. A robot according to any of the previous claims and wherein said controller provides a verification having a statistically insignificant probability of falsehood, of at least one of the position and orientation of said moving platform, in the event that two or more sensors simultaneously provide erroneous outputs.

11. A robot according to claim 10, and wherein the maximum value of said statistically insignificant probability is the product of the square of the probability that one sensor is providing an erroneous output divided by the number of incremental positions in that one of said sensors having the least resolution.

12. A robot according to any of the previous claims and wherein said plurality of extensible links is six links, and said single additional sensor is a seventh sensor.

13. A robot according to any of claims 1 to 11 and wherein said plurality of links is four links, and said single additional sensor is a fifth sensor.

14. A robot according to any of claims 1 to 13 and wherein said single additional sensor is one sensor more than the number of degrees of freedom of said robot.

15. A robot according to any of the previous claims and wherein said robot is a parallel robot.

16. A robot according to any of the previous claims and wherein said robot is a hybrid series-parallel robot.

17. A method of verifying the positional reliability of a robot, comprising the steps of:

providing a robot comprising a base member, a moving platform operative as the end effector of the robot, and a plurality of adjustable links connecting said base member to said moving platform, the status of each of said adjustable links being known by means of a sensor associated with each of said links; and

connecting a single additional sensor between said base member and said moving platform between predetermined points thereon.

18. A method according to claim 17 and also comprising the step of verifying by means of a controller that at least one of the position and orientation of said moving platform determined by the sensors associated with each of said plurality of links, is consistent with the corresponding relative position or orientation of said predetermined points as determined by said single additional sensor.

19. A method according to either of claims 17 and 18 and wherein at least one of said adjustable links is a linear extensible link.

20. A method according to claim 19 and wherein said sensor associated with said linear extensible link is a length sensor.

21. A method according to either of claims 17 and 18 and wherein at least one of said adjustable links is an angular rotational hinge.

22. A method according to claim 21 and wherein said sensor associated with said angular rotational hinge is an angular sensor.

23. A method according to either of claims 17 and 18 and wherein said single additional sensor is a length sensor.

24. A method according to either of claims 17 and 18 and wherein said single additional sensor is an angular sensor.

25. A method according to any of claims 17 to 24 and wherein said controller provides an absolute verification of at least one of the position and orientation of said moving platform in the event that any one sensor is providing an erroneous output.

26. A method according to any of claims 17 to 25 and wherein said controller provides a verification having a statistically insignificant probability of falsehood, of at least one of the position and orientation of said moving platform, in the event that two or more sensors simultaneously provide erroneous outputs.

27. A method according to claim 26, and wherein the maximum value of said statistically insignificant probability is the product of the square of the probability that one sensor is providing an erroneous output divided by the number of incremental positions in that one of said sensors having the least resolution.

28. A method according to any of claims 17 to 27 and wherein said plurality of extensible links is six links, and said single additional sensor is a seventh sensor.

29. A method according to any of claims 17 to 27 and wherein said plurality of links is four links, and said single additional sensor is a fifth sensor.

30. A method according to any of claims 17 to 29 and wherein said single additional sensor is one sensor more than the number of degrees of freedom of said robot.

31. A method according to any of claims 17 to 30 and wherein said robot is a parallel robot.

32. A method according to any of claims 17 to 30 and wherein said robot is a hybrid series-parallel robot.